

**Kate Gleason College of Engineering
Multidisciplinary Senior Design
Project Reviews (as of 11/6/07)**

Friday, November 9, 2007, 9:00am – 4:00 pm

Presentations:

Time	Gleason (09-4435)		Gleason (09-4425)		Gleason (09-3119)	
	Project	Track	Project	Track	Project	Track
9:00-9:30	P08006 - Motion Tracking System*	Bioengineering (Slack)			P08024 – Air Muscle	Assist. Devices (Lamkin-Kennard)
9:30-10:00	P08241 - Rat Simulator Test Device*	Vehicles (Slack)	P08050 – EEG Monitoring	Assist. Devices (Phillips)	P08042 – Cigarette Smoking	Assist. Devices (Lamkin-Kennard)
10:00-10:30	P08310 - Automatic Shift Control for ATV*	Controls (Slack)	P08101 – METEOR Instrumentation	Aerospace (Patru)	P08201 – RP10 Drive Platform	Vehicles (Walter)
10:30-11:00	P08321 - Low Density Parity Checking*	Controls (Reddy)	P08102 – METEOR RITSAT1	Aerospace (Patru)	P08454 – Underwater Equipment	Sustainability (Walter)
11:00-11:30	P08331 - Micro-Controller Starter Kit*	Controls (Slack)	P08105 – 1,000N HTPB/NOX Engine	Aerospace (Kozak)	P08456 – Underwater Light	Sustainability (Walter)
11:30-12:00			P08106 – Flying Rocket Body	Aerospace (Kozak)		
12:00-1:00	<i>Poster Session & Lunch - Design Center 09-4480*</i>		<i>Poster Session & Lunch - Design Center 09-4480*</i>		<i>Poster Session & Lunch - Design Center 09-4480*</i>	
1:00-1:30	P08027 - Wireless Control	Bioengineering (Brown)	P0851 – Fuser Test Bed	Imaging (Esterman)		
1:30-2:00	P08341 – RF Project (Proprietary no panelists)	Controls (Slack)	P08023 – Air Muscle	Assist. Devices (Lamkin-Kennard)		
2:00-2:30	P08009 – Audio Memo Device	Bioengineering (Slack)	P08025 – LVAD Durability Test	Bioengineering (Day)		
2:30-3:00	P08311 – FPGA Driver & DAQ	Controls (Slack)				
3:00-3:30	P08026 – Hemodynamic Flow	Bioengineering (Phillips)				
3:30-4:00	P08312 – Thermal Monitoring	Controls (Reddy)				

Shaded projects (and poster session) are “final” project reviews. All others are “mid-project” reviews.

Multidisciplinary Senior Design – Project Descriptions (November 9, 2007)

Assistive Devices and Bioengineering Track	
<i>Mid-Project Review (MSD I)</i>	
8009 – Audio Memo Device (Phase II)	This project is a lightweight clipboard-size device that will easily allow a blind person to record, and play back, at least 64 audible memoranda messages with categories such as Appointments, Special Dates, To-Do List, etc.
8023 – Air Muscle Artificial Limb #1	The primary objective is to design and develop an anatomically accurate, robotic hand that incorporates air muscles as a force generating mechanism. The design team will first be optimizing a current hand design and then shifting their efforts to the design and creation of a new hand design.
8024 – Air Muscle Artificial Limb #2	A competing design with the same objectives as 8023.
8025 – LVAD Durability Test Machine	To design and build a durability test machine for a magnetically levitated axial flow Left Ventricular Assist Device (LVAD) that is being developed here at RIT. The durability test machine will validate operation of the VAD pumps with the principal goal of testing the pumps over long duration (>1 year) of operation.
8026 – Modular Hemodynamic Flow Simulation System	Construction of a modular system that will allow reproduction of flows and pressures associated with hemodynamic systems. This system will enable experimentation and design verification associated with fundamental signal sources and properties of a biological circulatory system. It will allow the generation and measurement of arbitrary dynamic flow rates, volumes, pressures and the impact of variations in vessel size, compliance, fluid constitution and topology.
8027 – Wireless Assistive Control System	The purpose of this project is to use bio-signal technology to command a remotely controlled device through wireless technology. The device will control a RC car for KGCOE events to promote the electrical engineering department, specifically the biomedical program.
8042 – Cigarette Smoking Machine	The objective is to design and build a cigarette smoking machine and to develop hardware and software interfaces between the smoking machine and human lung casts. The machine will consist of a vacuum pump that pulls smoke through a cigarette and a series of flow meters and valves at a specified intervals.
8050 – Remote EEG Monitoring	A Remote EEG Sensor System has been designed to collect EEG data and provide various types of useful feedback directly to users or a remote monitor. The system consists of one or more low-power, portable EEG devices which are interfaced directly with an ad-hoc wireless network. Data from multiple persons wearing the portable EEG device can be simultaneously collected, stored, aggregated and analyzed in real time.
<i>Final Project Review (MSD II)</i>	
8006 – Motion Tracking System	The goal of this project is to provide Nazareth college with a device that accurately measures the specified joint angle while a patient is walking.

Aerospace Systems and Technologies Track	
<i>Mid-Project Review (MSD I)</i>	
8101 – METEOR Instrumentation Platform	Previous senior design teams have designed and implemented four versions of the Meteor Instrumentation Platform. This team will refine the latest hardware design, completely develop the necessary software, extensively test on the ground and flight test the Meteor Instrumentation Platform using a burst balloon and a zero-pressure balloon, scheduled for summer 2008.
8102 – METEOR RITSAT 1	RITSAT1, RIT's First Satellite, will serve as the payload for the METEOR launch platform, and will relay sensors data and control actuators. One previous senior design team has designed and built the RITSAT1 hardware. This project team will focus on the associated software development and ground testing of RITSAT, and test the satellite in flight at least once, tethered from the Instrumentation Platform.
8105 – METEOR Hybrid Rocket Motor	This project deals with the third stage of a three stage hybrid rocket. A hybrid rocket uses a combination of solid rocket fuel and a gaseous or liquid oxidizer in order to create thrust. The goal is to improve upon previous advancements on the third stage including fuel grain molding, nozzle development, and static testing.
8106 – Flying Rocket Body & Rocket Stage Integration	The project builds on previous work to develop a flying rocket body, including the oxidizer tanks, oxidizer delivery system, oxidizer flow control, and integrating all of this onto the flying rocket.
Vehicle Systems and Technologies Track	
<i>Mid-Project Review (MSD I)</i>	
8201 – RP10 Drive Platform (2 nd gen.)	This project will focus on correcting the design weaknesses of a prior design, to deliver a fully functional robot. The team will replace the current h-bridge system with an off-the-shelf subsystem, develop communications capability, and redesign the wheel/motor assembly.
<i>Final Project Review (MSD II)</i>	
8241 – Rat Simulator Test Device	This project entails development of a small device to simulate the thermal attributes of a small pet or rodent, to test functionality of a sensor for Bosch Security Systems.
Systems and Controls Technologies Track	
<i>Mid-Project Review (MSD I)</i>	
8311 – FPGA Multipurpose Driver & Data Acquisition	The goal of this project is to implement an FPGA-based, multi-purpose driver/data acquisition system, to support robotic projects and to realize a testing environment for analog and digital ASICs.
8312 – Dynamic Thermal Monitoring & Management for Mobile Processors	The goal of this project is to design an ASIC (Application Specific Integrated Chip) to measure real-time thermal data of individual processing units and to interface a thermal map to a host machine or a listener program that generates web-pages on a web server.
8341 – Anaren Microwave RF Project	The purpose of this project is to design a RF stripline circuit for operation within the EHF (Extremely High Frequency) band. The team will design several power dividers, interconnects, and additional RF circuitry using theoretical models, Ansoft Designer, 3D models in Ansoft HFSS, and AutoCAD.

<i>Final Project Review (MSD II)</i>	
8310 – Automatic Shift Control for ATV	A dynamic shifting system will be integrated into the current engine platform of a Polaris Outlaw 525 racing ATV. The purpose of the system is to enable rapid and efficient shifting.
8321 – Low Density Parity Checking	The proposed project is part of a concatenated coding scheme developed by D3 Engineering. Deliverables include a GUI application to generate the corresponding VHDL code for the LDPC encoder and decoder, and (2) implementation of the simulation environment on real-time computing hardware
8331 – Microcontroller Starter Kit	The goal of this project is to create a general use microcontroller PCB platform and a PCB layout tutorial, to offer future Senior Design teams a platform to perform preliminary evaluation of their individual electronics and technologies.
Sustainable Design and Product Development Track	
<i>Mid-Project Review (MSD I)</i>	
8454 – Underwater Equipment Technology	Unmanned Underwater Vehicles (UUVs) are used for many types of underwater tasks, either replacing human divers for safety and cost reasons, or allowing for exploration far below the maximum safe depth for human divers. This project focuses on improving impeller shape and selecting other components to make an optimized thruster.
8456 – Underwater Light	Design of a lighting system for an underwater robot. The system must provide sufficient light for objects to be clearly identifiable to the ROV pilot in a variety of water conditions and depths. The team will research issues pertaining to underwater visibility and review previous research on overcoming these difficulties.
Printing and Imaging Systems Technologies Track	
<i>Mid-Project Review (MSD I)</i>	
8501 – Roller-based Fuser Test Bed	The objective of this year's project is to develop a roller-based fuser test-bed that will improve upon a previous design that used a rotating cam. The new system is more representative of systems that are in use today by most printer manufacturers.

**Shaded projects (and poster session) are “final” project reviews. All others are “mid-project” reviews.*